Application Serial No.: 09/683,496

Attorney Docket No.: 57761.000185
Client Reference: 03GP-8049

CLAIM AMENDMENTS

Please enter the following amendments to the claims, which are presented in accordance with 37 C.F.R. §1.121.

1. **(Currently amended)** An apparatus for cooling one or more electrical protective devices mounted to at least one electrical terminal, the apparatus comprising:

one or more coolant passages being thermally-conductive with at least one electrical terminal, the at least one electrical terminal being in the shape of a plate; and

one or more coolant sources, connected to the one or more coolant passages, for passing coolant fluid through the one or more coolant passages, whereby the at least one electrical terminal is cooled; and

at least one of the coolant passages being disposed along and in parallel to the at least one electrical terminal such that a length, of a portion, of the at least one of the coolant passages lies along the electrical terminal that is in the shape of a plate

wherein the one or more coolant passages are tubes made from at least one of the group of materials consisting of stainless steel, steel, copper, and aluminum.

2. **(Currently amended)** An apparatus for cooling one or more electrical protective devices mounted to at least one electrical terminal, the apparatus comprising:

one or more coolant passages being thermally-conductive with at least one electrical terminal, the at least one electrical terminal being in the shape of a plate; and

one or more coolant sources, connected to the one or more coolant passages, for passing coolant fluid through the one or more coolant passages, whereby the at least one electrical terminal is cooled; and

at least one of the coolant passages being disposed along and in parallel to the at least one

electrical terminal such that a length, of a portion, of the at least one of the coolant passages lies along the electrical terminal that is in the shape of a plate; ~~The apparatus of claim 1,~~

wherein at least one of the one or more electrical protective devices is a fuse array comprising two or more fuses.

3. (Original) The apparatus of claim 2, wherein each fuse has opposed longitudinal ends, each end being mounted to an electrical terminal.

4. (Original) The apparatus of claim 2, wherein the fuse array is comprised of two or more fuses arranged in rows and columns.

5. **(Previously presented)** The apparatus of claim 4, wherein the one or more coolant passages are attached to each of the electrical terminals between each of the columns, the coolant passages being connected to the electrical terminal along a portion of a length of the coolant passages.

6. (Original) The apparatus of claim 2, wherein the fuse array has a fuse operating temperature range of approximately 0 degrees Celsius to approximately 100 degrees Celsius.

7. (Original) The apparatus of claim 1, wherein the electrical protective device protects a power converter.

8. (Original) The apparatus of claim 1, wherein the electrical terminal is made from at least one of the group of materials consisting of copper, iron, steel, and aluminum.

9. **(Canceled)**

10. **(Previously presented)** The apparatus of claim 5, wherein the coolant

passages are brazed to the terminals providing brazed joints connecting the terminal to the coolant passages, the brazed joints partially enveloping the coolant passages along a length of the coolant passages.

11. (Original) The apparatus of claim 1, wherein the coolant fluid is an electrically non-conductive material.

12. (Original) The apparatus of claim 11, wherein the coolant fluid is deionized water.

13. (Original) The apparatus of claim 1, wherein the one or more coolant sources are connected to the one or more coolant passages by one or more conduits.

14. (Original) The apparatus of claim 13, wherein the one or more conduits are made from an electrically non-conductive material.

15. (Original) The apparatus of claim 14, wherein the one or more conduits are made from silicone.

16. (Canceled)

17. (Original) The apparatus of claim 1, further comprising one or more heat exchangers, interposed with the one or more coolant passages and the one or more coolant sources, for cooling the coolant fluid.

18. (Original) The apparatus of claim 17, wherein the heat exchanger evacuates waste heat from the coolant fluid to one or more additional fluids.

19. (Original) The apparatus of claim 18, wherein the waste heat evacuated into the one or more additional fluids is used as a source of high quality heat.

20. **(Previously presented)** An apparatus for cooling a fuse array mounted between two electrical terminals comprising:

at least one coolant passage being attached to each of the electrical terminals such that the coolant passage divides each of the electrical terminals into approximately equally sized regions; and

groupings of fuses attached to and disposed respectively intermediate the two electrical terminals in each of the approximately equally sized regions, thereby interconnecting the electrical terminals; and

at least one of the coolant passages being disposed along and in parallel to the at least one electrical terminal such that a length, of a portion, of the at least one of the coolant passages lies along the electrical terminal, which is in the shape of a plate.

21. (Original) The apparatus of claim 20, further comprising a plurality of coolant conduits, connected to the coolant passage, at least one of the coolant conduits being connected to at least one coolant source for passing the coolant fluid through the coolant conduits and the coolant passages.

22. (Original) The apparatus of claim 20, wherein the fuse array comprises groupings of fuses configured in columns.

23. **(Currently amended)** A method for cooling one or more electrical protective devices mounted between electrical terminals comprising:

attaching one or more coolant passages in a thermally-conductive manner to at least one electrical terminal along a length of the coolant passages; and

connecting one or more coolant sources to the one or more coolant passages, for passing coolant fluid through the one or more coolant passages;

at least one of the coolant passages being disposed along and in parallel to the at least one electrical terminal such that a length, of a portion, of the at least one of the coolant

passages is connected to the electrical terminal, which is in the shape of a plate; and

further comprising making the one or more coolant passages from tubes made from at least one of the group of materials consisting of stainless steel, steel, copper, and aluminum.

24. **(Currently amended)** A method for cooling one or more electrical protective devices mounted between electrical terminals comprising:

attaching one or more coolant passages in a thermally-conductive manner to at least one electrical terminal along a length of the coolant passages; and

connecting one or more coolant sources to the one or more coolant passages, for passing coolant fluid through the one or more coolant passages;

at least one of the coolant passages being disposed along and in parallel to the at least one electrical terminal such that a length, of a portion, of the at least one of the coolant passages is connected to the electrical terminal, which is in the shape of a plate; ~~The method of claim 23,~~ wherein at least one of the one or more electrical protective devices is a fuse array comprising two or more fuses.

25. (Original) The method of claim 24, wherein each fuse has opposed longitudinal ends, each end being mounted to an electrical terminal.

26. (Original) The method of claim 24, wherein the fuse array is comprised of two or more fuses arranged in rows and columns.

27. (Original) The method of claim 26, wherein the step of attaching one or more coolant passages comprises attaching one or more coolant passages to each of the electrical terminals between each of the columns.

28. (Original) The method of claim 24, wherein the fuse array has a fuse operating

temperature of between approximately 0 degrees Celsius and approximately 100 degrees Celsius.

29. (Original) The method of claim 24, wherein the electrical device protected by the one or more fuses is a power converter.

30. (Original) The method of claim 23, further comprising making the at least one electrical terminal from at least one of the group of materials consisting of copper, iron, steel, and aluminum.

31. **(Canceled)**

32. (Original) The method of claim 23, further comprising brazing the one or more coolant passages to the at least one electrical terminal.

33. (Original) The method of claim 23, wherein the coolant fluid comprises an electrically non-conductive material.

34. (Original) The method of claim 33, wherein the coolant fluid comprises providing deionized water.

35. (Original) The method of claim 23, wherein the step of connecting one or more coolant sources to the one or more coolant passages comprises connecting one or more coolant sources to the one or more coolant passages by one or more conduits.

36. (Original) The method of claim 35, wherein the one or more conduits are made from an electrically non-conductive material.

37. (Original) The method of claim 36, wherein the one or more conduits are made from silicone.

38. (Original) The method of claim 23, further comprising locating one or more heat exchangers between the one or more coolant passages and the one or more coolant

sources, for cooling the coolant fluid.

39. (Original) The method of claim 38, further comprising evacuating waste heat from the coolant fluid to one or more additional fluids.

40. (Original) The method of claim 39, further comprising using the waste heat evacuated into the one or more additional fluids as a source of high quality heat.

41. (Original) A method for cooling a fuse array mounted between two electrical terminals comprising:

attaching a pair of coolant passages, each shaped to have two or more roughly parallel lengths, to each of the electrical terminals along the roughly parallel lengths such that the roughly parallel lengths of each of the coolant passages divide each of the electrical terminals into approximately equally sized regions;

attaching a column of fuses to each electrical terminal in each of the approximately equally sized regions, thereby interconnecting the electrical terminals;

providing coolant fluid; and

connecting a plurality of coolant conduits to the pair of coolant passages

connecting at least one of the coolant conduits to at least one coolant source for passing the coolant fluid through the coolant conduits and the coolant passages.

42. **(Previously presented)** A method for increasing the electrical current rating of a fuse above its normal electric current rating comprising:

attaching one or more fuses to at least one electrical terminal;

attaching one or more coolant passages in a thermally-conductive manner to the at least one electrical terminal; and

connecting one or more coolant sources to the one or more coolant passages, for

passing coolant fluid through the one or more coolant passages; and

wherein the attaching one or more coolant passages in a thermally-conductive manner to the at least one electrical terminal includes attaching a pair of coolant passages, each shaped to have two or more roughly parallel lengths, to an electrical terminal along the roughly parallel lengths such that the roughly parallel lengths of each of the coolant passages divide the electrical terminal into approximately equally sized regions.

43. **(Previously presented)** A method for increasing the service life of a fuse above its normal service life comprising:

attaching one or more fuses to at least two electrical terminals;

attaching one or more coolant passages in a thermally-conductive manner to the at least one electrical terminal; and

connecting one or more coolant sources to the one or more coolant passages, for passing coolant fluid through the one or more coolant passages; and

wherein the attaching one or more coolant passages in a thermally-conductive manner to the at least one electrical terminal includes attaching a pair of coolant passages, each shaped to have two or more roughly parallel lengths, to an electrical terminal along the roughly parallel lengths such that the roughly parallel lengths of each of the coolant passages divide the electrical terminal into approximately equally sized regions, the electrical terminals each being plate-like; and

wherein each electrical terminal is provided with substantially identical coolant passage arrangements.

44. (Original) The method of claim 43, wherein the electrical current rating of the

fuse is increased above its normal electric current rating while maintaining fuse thermal capacity electrical coordination with an electrical device protected by the fuse.

45. (Original) The method of claim 44, wherein the thermal capacity electrical coordination is calculated by the current squared and multiplied by the time.

46. (Original) The method of claim 43, wherein the electrical current rating of the fuse is increased above its normal electric current rating while maintaining fuse electrical arc voltage coordination with an electrical device protected by the fuse.

47. **(Currently amended)** An apparatus for cooling one or more electrical protective devices mounted to at least one electrical terminal, the apparatus comprising:

one or more coolant passages being thermally-conductive with at least one electrical terminal, the at least one electrical terminal being in the shape of a plate; and

one or more coolant sources, connected to the one or more coolant passages, for passing coolant fluid through the one or more coolant passages, whereby the at least one electrical terminal is cooled; and

at least one of the coolant passages being disposed along and in parallel to the at least one electrical terminal such that a length, of a portion, of the at least one of the coolant passages lies along the electrical terminal that is in the shape of a plate;

~~The apparatus of claim 1,~~

wherein the at least one of the coolant passages is shaped to have two or more roughly parallel lengths, laying against an electrical terminal along the roughly parallel lengths such that the roughly parallel lengths of each of the coolant passages divide each of the electrical terminals into approximately equally sized regions.